

GARRETT W. HOOVER, & JAMES WOOD, Dept of Biological Sciences, West Liberty University, West Liberty, WV 26074. Analysis of localized water chemistry and land use drivers of macroinvertebrate community structure in the Upper Ohio Watershed using multivariate modelling and ordination techniques.

An assessment of land use, water chemistry and macroinvertebrate community data was performed at 20 stream sites in southwestern Pennsylvania and West Virginia's Northern Panhandle. Project sites were located on streams spanning six different watersheds from a variety of catchment sizes and land use characteristics. Macroinvertebrate community characteristics were analyzed using ordination techniques including Nonmetric Multidimensional Scaling (NMS) and hierarchical agglomerative cluster analysis, and predictive effects of ambient physicochemical stream conditions and watershed land use were evaluated using hierarchical modelling via Integrated Nested Laplace Approximation (INLA). Ordinations showed watershed development, shredder biomass, ambient annual turbidity, and riparian forest cover as primary drivers of dissimilarity between macroinvertebrate communities. INLA models identified significant negative relationships between macroinvertebrate community diversity and ambient annual conductivity, turbidity and watershed development. Results support regionwide water quality assessments citing conductivity and sedimentation as prevailing in-stream stressors, as well as land use characteristics as determining factors of water quality, even at localized scales.